States lead in GIS revolution: Warnecke

Lisa Warnecke of Syracuse, N.Y., is a consultant specializing in geographic and land information development.

Between 1977 and 1983 she was town manager for small communities in Colorado, including service as a circuit rider for more than one town at a time. Later, she served Wyoming and Colorado as a budget analyst and geographic information coordinator, respectively.

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Since 1988, she has been working full-time to improve the coordination and development of geographic information throughout the country.

Most of her efforts have involved inventory, analysis and promotion of state geographic information coordination efforts. She is the principal investigator for a Council of State Governments project, "State Geographic Information Activities Compendium," to be released in the fall.

She is here today to discuss her findings from the research done to complete the compendium.

U.S. Rep. George E. Brown Jr., chairman of the House Science, Space and Technology Committee, calls it "GIS revolution" and says the use of geographic information systems will "literally change the way we think about and tackle problems at every level of society."

And, according to recent research, the states are leading the way.

Findings from the Council of State Governments' "State Geographic Information Activities Compendium" provide detailed evidence of the states' innovation and leadership in geographic information systems (GIS). It indicates that states are increasingly the key level of government in the country to develop and implement national goals. *(See related story, this page)*

Known as one of the hottest information technologies, GIS also is one of the few technologies developed by and for the public sector. Today, each of the 50 states is using GIS in one or more of its agencies, and each also has a related coordinated initiative.

As public sector problems become increasingly interdependent and complex, as do the risks of redundancy and mistakes, the need for interagency and intergovernmental collaboration is increasingly more evident.

Each state has at least one increasingly powerful interagency group related to GIS. Some groups are broadening involvement to include the legislative and judicial branches. But beyond state government, coordination groups also include localities, federal agencies, higher education and the private sector.

Geographic Information Councils (GICs) have been established in various ways. New Mexico's GIC, authorized by a governor's executive order, was incorporated as a nonprofit corporation. Utah's GIC and Nebraska's GIS Steering Committee were authorized by their legislatures this year.

And the information councils work on varied projects.

An important role of the innovative Ohio Data Network will be to facilitate geographic data sharing between state agencies and local governments, according to Ron Vidmar, director of policy and planning in the Office of Information Systems.

The number of state directives regarding geographic information are increasing.

Specific legislation was adopted in Maine, Mississippi, Nebraska, Rhode Island and Utah providing direction for GIS, coordination groups and/or related data development.

The Michigan and Wisconsin legislatures approved increased land transfer fees to support geographic information development, with efforts focused at the local level. Legislative action in Florida provided $800,000 for multipurpose data to be used in GIS.

Some states provide specific missions and funding for GIS: growth management in Georgia, Vermont and Washington; timberland in California; wetlands in Maryland; groundwater in Idaho and oil spills in New Jersey.

Sharing is unique to geographic information and GIS as compared to other technologies, explains Ben Froehlich, assistant director of Arizona's Department of Administration and chairman of Arizona's GIC.

In Montana, a memorandum of understanding was signed by 18 federal and state agencies to coordinate GIS activities.

Federal and state agency representatives in Oregon and Washington signed an agreement to participate in and fund the unique Northwest Land Information Systems (LIS) Network and its projects.

Increasingly, states are involved in efforts to inventory data, with "metadata" development efforts and clearinghouse services.

The Northwest LIS Network is building a Spatial Data Index. Other states, including Florida, Montana and Rhode Island, are developing hard copy, disk version and/or online catalogs of digital

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Compendium lists state GIS info

"State Geographic Information Activities Compendium," published by Council of State Governments, Lexington, Ky.; September 1991; Lisa Warnecke, principal investigator.

With more than 400 pages, the compendium provides detailed information on state geographic information systems (GIS) in each of the 50 states.

Included are Individual State Profiles, with narrative descriptions of statewide and agency level GIS, including:

- State legislation: executive orders, memoranda of understanding, plans, policies, standards, programs, projects and catalogs;
- Statewide geographic information coordination groups and activities;
- Relations and cooperative efforts with federal, local and regional agencies;
- Reports of more than 300 state agency and university GIS activities focusing on GIS technology, resource commitments, data development and applications;
- Background accounts of the historical development of geographic information and GIS in each of the states — some beginning more than 20 years ago;
- Annotated bibliography and abstracts of more than 200 state-produced documents; and
- Document excerpts from exemplary state directives and documents.

The Individual State Profiles are based on material collected by Ms. Warnecke since 1985, revised and verified through hundreds of personal interviews with state GIS officials.

The information reflects developments in GIS programs through the 1991 legislative sessions.

Other information in the compendium includes the Directory of State GIS Officials, which lists names, addresses and functions of more than 2,000 contacts instrumental in the development, direction and coordination of geographic information in all the states. The directory also provides information on official state contacts regarding geographic information.

In addition, there are more than a dozen Tables of Comparative Data, generated through a national survey of state GIS programs and officials, that compare and contrast statewide issues, goals, objectives, plans, policies, standards, and roles and responsibilities of key groups and agencies.

The tables also describe the GIS-related functions of central information policy and information technology offices.

The compendium is available from the Council of State Governments for $79 per copy. To order, call (800) 800-1910, reference C-002-91.

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data useful with GIS.

On the national level, state geologists, working with industry, trade and professional associations and academia, initiated proposals for the Geologic Mapping Program, now under consideration by Congress, to provide a mechanism for collecting detailed geologic information. If passed, the legislation would provide federal funds ranging from $15 million in the first year to $25 million in the fourth, with a matching requirement from the states. House and Senate hearings were held in late July.

According to Oklahoma State Geologist Charles Mankin, the legislation may have enough support for passage, and states already have indicated funds are available for the matching requirement.

Perhaps more than any other information technology, GIS is promoting intergovernmental connectivity, "one of the fastest growing trends in GIS development," says Phil Thiel, an assistant director in Georgia's Department of Community Affairs.

Local government needs were the focus of the 1990 legislation in Michigan and Wisconsin hiking land transfer fees to subsidize geographic information development. More than half of the over $2 million in annual funds will be used by counties.

Data exchanged between state, regional and local entities is a growing trend, with states providing the guidance.

Comprehensive growth management acts in Georgia, Vermont and Washington provided funds and assistance for data development and GIS at local and regional levels.

Counties in New Jersey receive data from, and provide data to, the state Department of Environmental Protection. The Arizona Department of Transportation is exchanging data with Maricopa County, resulting in significant savings.

Most state governments have an interagency information policy or technology coordinating group. One of these groups, the Nebraska Intergovernmental Data Communications Advisory Council (NIDCAC), also focuses on local government needs. Its members include seven state agency representatives and five from localities.

According to Steve Henderson, assistant director of Nebraska's Central Data Processing Division, "NIDCAC provides an intergovernmental forum for information exchange and ultimately better government service."

NIDCAC's efforts have resulted in automated information exchange using programs such as child support and vehicle titling systems used by state agencies and counties.

Since the late 1970s, Minnesota has had the Intergovernmental Information Systems Advisory Council (IISAC), comprising seven representatives from state agencies and 18 from local governments. Executive Director Jim Krautkremer says the IISAC facilitates communication, "helping governments understand each other," and serves as an ombudsman and representative for localities relating to state government.

The council, with a state-funded budget and two staff members, provides grants and support for software useful to local governments.

Following a request for proposal that produced no satisfactory private sector bids, IISAC funded the State Auditor's Office to develop an auditing program that met state requirements.

GIS is increasingly used for all state functions, and individual agencies are adopting organization-wide approaches.

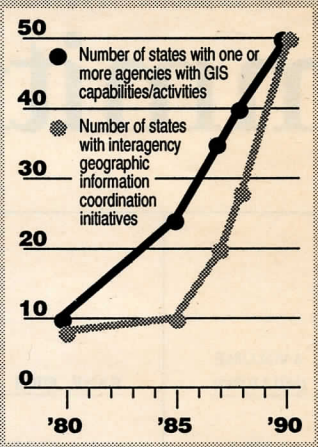
Minnesota's Department of Natural Resources has used similar geographic frameworks for tabular data in its divisions for over a decade.

Beginning in the 1960s, GIS was used in some natural resources and environmental applications. Today, each of the states has one or more uses of GIS in natural resources and environmental programs, particularly to protect ground water, wetlands and natural resource management.

GIS also is used for state lands management and purchasing priorities in Arizona, Florida and Washington. Siting decisions for low-level hazardous and solid-waste sites are increasingly difficult, and governments have additional difficulty balancing interests and needs without GIS.

In Rhode Island and Maine, waste siting decisions were the major incentive and funding resource for GIS data development. Illinois' Department of Energy and Natural Resources develops data for its counties to use with GIS to help select solid-waste disposal sites.

Historical development of geographic information systems in states



Graphic by Cynthia Watson

GIS applications for infrastructure management and planning also are increasing. Property tax administration is being supported by GIS in New York. Each state department of transportation has some computer-aided drafting efforts, some linked with GIS capabilities.

(Increasing use led to a 1990 survey of GIS in transportation departments. The survey, which was conducted by the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and a Transportation Research Board project entitled "GIS-Transportation," will be available later this fall.)

State utility commissions that regulate gas, electric, telephone, water and wastewater utilities and their rates and management practices are beginning to use GIS applications while utilities are using Automated Mapping and Facilities Management for internal needs.

State commissions in Kansas, Mississippi, New Hampshire and Ohio are using GIS for boundary reviews and planning.

(Recognizing this growing use and potential for collaboration instead of conflict between utility providers and regulators, Automated Mapping/Facilities Management International, an association of utilities in 1990 funded a survey of GIS in state commissions, also conducted by Ms. Warnecke.)

Growth management, planning and economic development GIS applications are on the rise.

South Carolina's efforts resulted in full infrastructure data being developed for economic development purposes, also useful for local planning.

Illinois has merged Dun and Bradstreet data in its GIS program to assist in industry marketing.

Human services delivery and public safety applications hold large potential for GIS use, particularly with the availability of federal TIGER (Topologically Integrated Geographic Encoding and Referencing) system data developed to support the 1990 census.

Though plans and funding have not been implemented to maintain this valuable public resource an investment, TIGER data is useful for many underdeveloped social and human service GIS applications eliminating the need for new data.

The focus on geographic information and GIS use is beginning to improve the quality and effectiveness of service delivery. California, New York and Texas are using GIS in the delivery of social services. Client and service center locations are analyzed to better plan for resource commitments. Addresses of job seekers can be matched with potential employers, for instance.

In addition, socio-economic data linked with GIS environmental data, for example, would allow the tracking of disease.

Education departments also are considering using GIS and the federal Department of Education is funding digital data about school district boundaries across the country.

GIS is beginning to be applied in virtually all aspects of state government.

While it can be argued that collectively federal agencies and local governments spend more money on GIS, states are increasingly influencing activities at federal, regional and local levels.

State leadership, indeed, is the key to maximizing GIS in a partnership between all levels of government.